Keeping it Green: Integrated QA with the Yocto Project

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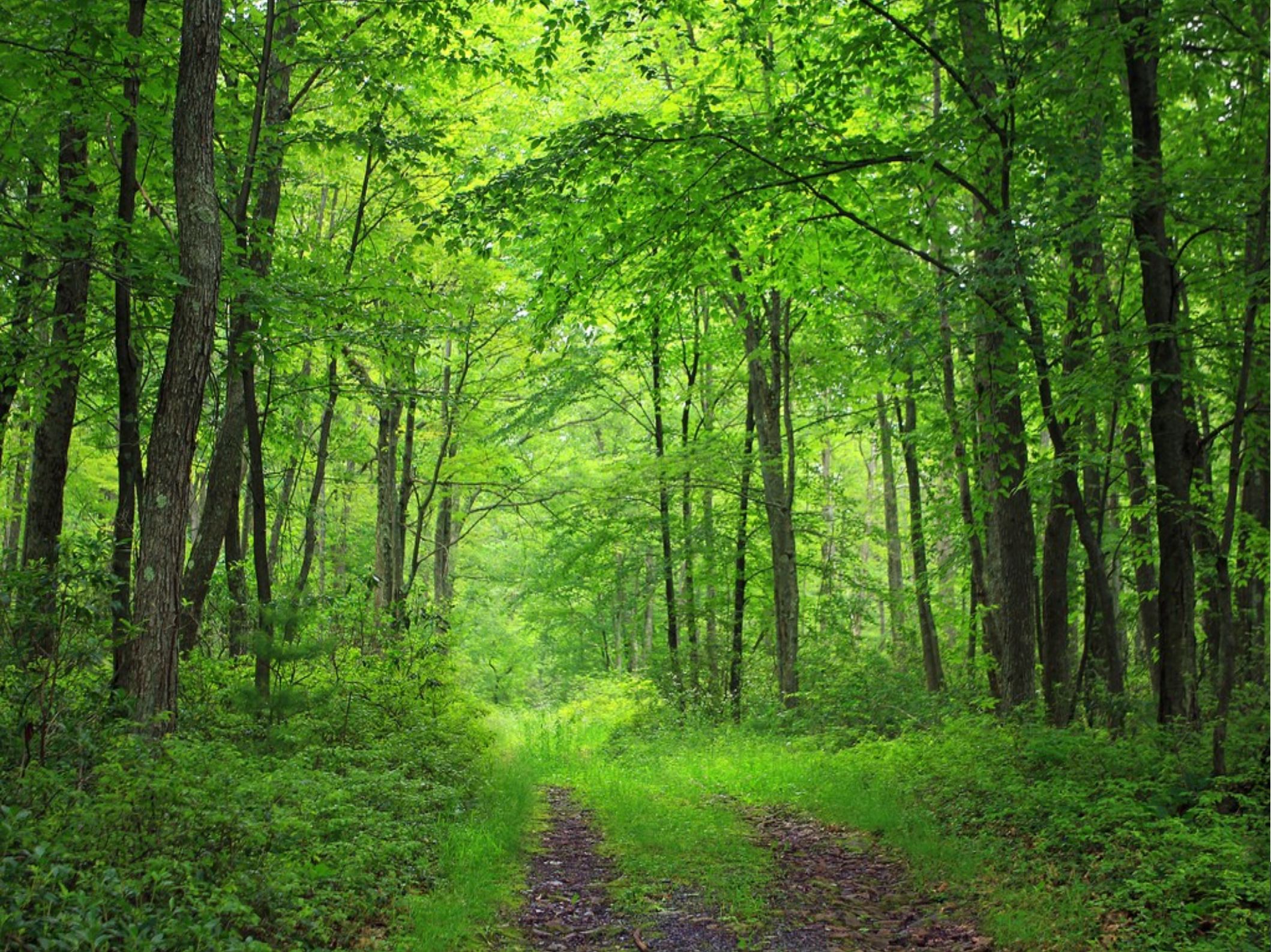

STOP
FRACKING
STOP
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STOP
FRACKING
The Greens | EFA
in the European Parliament

?

Buildbot - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Buildbot

autobuilder.yoctoproject.org:8011/grid

Home - Waterfall Grid T-Grid Console Builders Recent Builds Buildslaves Changesources - JSON API - About
paule [paule@localhost] |Logout

Grid View

The Yocto Autobuilder	Commit: eb616cf017ce...	Commit: df8e1d052927...	Commit: 56ea7aca3e6b...	Commit: 4e4831e80743...
build-appliance	Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: master-next Repo: poky Build: OK
buildtools		Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: master-next Repo: poky Build: OK
eclipse-plugin-juno	Build: OK	Build: OK	Build: OK	Build: OK
eclipse-plugin-kepler		Build: OK	Build: OK	Build: OK
minnow		Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: master-next Repo: poky Build: OK
minnow-lsb	Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: master-next Repo: poky Build: OK
nightly	Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: mut Repo: poky-contrib Build: OK	Branch: master-next Repo: poky Build: OK

Yocto Project

- Extend and improve the core of OpenEmbedded (OE-Core)
- Develop additional tools around it
- Releases on a 6 month cadence
- Help make building an embedded Linux OS easier

Why automated testing?

- Confidence that changes haven't introduced regressions
- Humans don't need to do what a machine could be doing
- Avoid everyone re-inventing the wheel
- Developers can run tests on their own machines

Runtime testing (1.5+)

- **New framework for 1.5**
  - Replaces old shell-based “imagetest” framework
  - Python-based (unittest)
  - Tests run on the build host, run commands on target over SSH
  - QEMU targets only (for now)

Runtime testing (1.5+)

- **Easy to run**
  - Automatically after building an image
  - Explicitly
- **Choose which tests to run**
- **Minimal intrusion into CI server setup**
  - (and doesn't require one)

Runtime testing (1.5+)

- **Easy to extend**
  - Written in Python
  - Unimportant details abstracted away
  - Extensible with standard layer mechanism

Running tests

- **To enable running tests automatically after building any image:**
  - In local.conf:
    `TEST_IMAGE = “1”`

- **To run manually:**
  - In local.conf:
    INHERIT += “testimage”
  - Each time:
    `$ bitbake -c testimage <imagename>`

Finding tests

- **Core tests located in meta/lib/oeqa/runtime**
- **Additional layers can add their own**
  - Add python modules in lib/oeqa/runtime under the layer
  - Should not use same names as modules in OE-Core
- **Specify tests to run by setting TEST_SUITES variable**

Example test cases

```
meta/lib/oeqa/dmesg.py
meta/lib/oeqa/df.py
meta/lib/oeqa/smart.py
```

Other automated testing features

ptest

- **Run tests from upstream software package**
- **Provides packaging and installation of test suites**
- **Runner script for the target (**run-ptest**)**
- **Idea is to coalesce test output to the same format**

Autobuilder

- Continuous Integration server
- Based on Buildbot
- Configured to run builds & tests out of the box

bitbake-selftest

- Simple test script for bitbake itself
- Helps avoid regressions when working on bitbake
- Quick to run

Other scripts

- **test-reexec**
  - Tests re-execution of tasks
- **test-dependencies.sh**
  - Finds “floating” auto-detected dependencies

Future plans

Future (1.6+) - Runtime tests

- **Runtime tests on real hardware**
  - Simple – one or two machines, directly attached
  - Advanced – number of machines attached to test server (“test rack”)
  - “push model” vs “pull model”
- **ptest integration**
  - Report collection / analysis
- **Additional runtime tests**
- **GUI tests**

Future (1.6+)

- **Non-runtime tests**
  - “oe-selftest”
  - Converting current manual test cases into automated tests

Social effects

- **Improve communication between development & QA**
- **Opportunities for QA to become more directly involved**

Summary

- New testing framework
- More testing-related improvements to come
- Focus on quality
- Send us feedback
- Get involved!

Questions?

Thank you for your participation!

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